LOS Engineering, Inc.
Traffic and Transportation

6342 Ferris Square, San Diego, CA 92121
Phone 619-890-1253, Fax 619-374-7247

November 29, 2006

Mr. Barry Beech
County of San Diego
5201 Ruffin Road, Suite B
San Diego, CA 92123

SUBJECT: Traffic Letter Report for TM 5404 RPL2 (Valencia Square Condominiums)

Dear Mr. Beech:

The purpose of this traffic letter report is to determine if any direct traffic impacts would result from the proposed project, to document the corner sight distance/intersection spacing at the project driveway, and to document that the applicant agrees to pay into the Transportation Impact Fee (TIF) program to mitigate any potential cumulative impacts. The project is located on the south side of the 8900 block of Valencia Street in the Spring Valley area of San Diego County. The project consists of 20 condominium units that will replace a single family dwelling unit. A vicinity map is shown in **Figure 1** with a preliminary site plan shown in **Figure 2**. All figures are located at the end of this letter.

SIGNIFICANCE CRITERIA

The significance criteria is based on the County of San Diego *Guidelines for Determining Significance*, as shown in **Table 1**.

Table 1: County of San Diego Significant Traffic Impact Thresholds

Measures of Significant Project Impacts to Congestion Allowable Increases on Congested Roads and Intersections					
	Road Segments			Intersections	
Operations	2-Lane Road	4-Lane Road	6-Lane Road	Signalized	Unsignalized
LOS E	200 ADT	400 ADT	600 ADT	Delay of 2 seconds	20 peak hour trips on a critical movement
LOS F	100 ADT	200 ADT	300 ADT	Delay of 1 second, or 5 peak hour trips on a critical movement	5 peak hour trips on a critical movement

Source: County of San Diego *Guidelines for Determining Significance* Table 1 from page 9. Note: A critical movement is one that is experiencing excessive queues. By adding proposed project trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes any trips must mitigate a share of the cumulative impacts. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.

A direct impact would occur when the significance criteria is exceeded. If the proposed project exceeds the values provided in the above table, then the individually proposed project would result in a direct traffic impact. Specific improvements to mitigate direct impacts must be identified.

A cumulative impact would occur when two conditions are met: 1) build-out of all near term projects will result in a cumulative traffic impact and 2) the amount of traffic generated by the individual proposed project contributes (even in a small part) to that cumulative impact. Both conditions must be met for an individual project to result in a cumulative traffic impact. If the traffic generated from all the near term projects (cumulative projects) would result in a cumulative traffic impact then condition one is met. If the total amount of traffic generated exceeds the values provided in the above table, then condition 2 is met and the individually proposed project would result in a cumulative traffic impact.

PROJECT TRAFFIC GENERATION

The project consists of 20 condominiums. A trip credit was not taken for the existing single family dwelling unit because the dwelling unit is not occupied. Using SANDAG trip rates from the *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002, the traffic generation is calculated at 160 ADT with 13 AM peak our trips (3 inbound and 10 outbound) and 16 PM peak hour trips (11 inbound and 5 outbound) as shown in **Table 2**.

Table 2: Project Traffic Generation

Proposed							AM					PM	
Land Use	Rate	Size & Units	ADT	%	Split		IN	OUT	%	Split		IN	OUT
Residential - Multi Family	8 /DU	20 DU	**160**	8%	0.2	0.8	**3**	**10**	10%	0.7	0.3	**11**	**5**

Source: SANDAG *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region,* April 2002.

DU - Dwelling Unit; ADT-Average Daily Traffic; Split-percent inbound and outbound.

PROJECT DISTRIBUTION AND ASSIGNMENT

The project distribution as shown in **Figure 3** was based on the proximity of the SR-94 interchange at Bancroft Drive, the SR-125 interchange at Jamacha Road, surrounding schools, and surrounding shopping areas. The project distribution takes into consideration the existing turn restrictions at the intersection of Sweetwater Road/Valencia Street. The project assignment is shown in **Figure 4**.

STUDY AREA

The study area was based on the extent of where at least 5 peak hour project trips and at least 100 daily project trips would travel. This basis is from the LOS F thresholds as outlined in the significance criteria. As shown in Figure 4, two intersections were analyzed because at least 5 peak hour trips are anticipated to travel through these intersections. Even though there would be less than 100 ADT added to any surrounding roadway segments, the segment of Valencia Street was still analyzed per the request of County staff.

EXISTING CONDITIONS

The existing roadway conditions are shown in **Figure 5**. Valencia Street in the vicinity of the project is a two lane undivided roadway (one lane in each direction) with parking provided on both sides of the roadway. Valencia Street is constructed with approximately 38 feet of pavement. Existing counts (AM & PM peak hours) were collected at the intersections of Bancroft Drive/Troy Street and at Bancroft Drive/Valencia Street on 6/14/2006. ADT counts were collected for Valencia Street on 4/21/2005. Existing volumes are shown in **Figure 6** with existing + project volumes shown in **Figure 7**. Counts are included in **Attachment A**.

The study intersections were analyzed based on the **operational analysis** outlined in the 2000 HCM. This process defines LOS in terms of **average control delay** per vehicle, which is measured in seconds. LOS at the intersections were calculated using the computer software program Synchro 6.0 (Trafficware Corporation, 2003). The HCM LOS for the range of delay by seconds for un-signalized intersections is described in **Table 3**.

Table 3: Un-Signalized Intersection Level of Service (HCM 2000)

Level of Service (LOS)	Un-Signalized Average Control Delay (seconds/vehicle)
A	0-10
B	> 10-15
C	> 15-25
D	> 25-35
E	>35-50
F	> 50

Source: Highway Capacity Manual 2000.

The LOS calculated for the intersections are shown in **Table 4**, for existing and existing + project conditions.

Table 4: Existing and Existing + Project Intersection LOS

Intersection & (Control)[1]	Move-ment	Peak Hour	Existing		Existing + Project			
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Sig[5]
1) Bancroft Dr/Troy St (U)	WB L	AM	8.1	A	8.1	A	0.0	No
	NB LR	PM	14.1	B	14.2	B	0.1	No
	WB L	AM	8.3	A	8.3	A	0.0	No
	NB LR	PM	13.9	B	14.1	B	0.2	No
2) Bancroft Dr/Valencia St (U)	EB LTR	AM	12.1	B	12.2	B	0.1	No
	WB LTR	PM	10.5	B	10.6	B	0.1	No
	EB LTR	AM	12.6	B	12.8	B	0.2	No
	WB LTR	PM	11.0	B	11.1	B	0.1	No

Notes: 1) Intersection HCM Analysis - (S) signalized, (U) unsignalized control 2) Delay: HCM control delay measured in seconds. 3) LOS - Level of Service 4) Delta is the increase in delay from project. 5) Significant Impact ? (Yes or No).

As shown in Table 4, no project impacts were calculated because the increase in delay due to project traffic is below the allowable significance criteria. Calculations are included in **Attachment B**.

The street segments were analyzed based on the functional classification of the roadway using the County of San Diego *Average Daily Vehicle Trips* capacity lookup table. The roadway segment capacity and LOS standards used to analyze the street segment is summarized in **Table 5**.

Table 5: Street Segment Daily Capacity and LOS (County of San Diego)

Circulation Element Road Classification	CROSS SECTION	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway	126/146	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial	102/122	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road	78/98	<14,800	<24,700	<29,600	<33,400	<37,000
Collector	64/84	<13,700	<22,800	<27,400	<30,800	<34,200
Town Collector	54/74	<3,000	<6,000	<9,500	<13,500	<19,000
Light Collector	40/60	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Collector	40/84	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Light Collector	40/60	<1,900	<4,100	<7,100	<10,900	<16,200
Recreational Parkway	40/100	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Mountain	40/100	<1,900	<4,100	<7,100	<10,900	<16,200
Non-Circulation Roads						
Residential Collector	40/60	NA	NA	<4,500	NA	NA
Residential Road	36/56	NA	NA	<1,500	NA	NA

Source: County of San Diego Department of Public Works *Public Road Standards* July 14, 1999.

The LOS calculated for the segment is shown in **Table 6**, for existing and existing + project conditions.

Table 6: Existing and Existing + Project Segment LOS

Segment	Current Classification (as built)	LOS E Capacity	Existing			Project	Existing + Project				
			Daily Volume	V/C	LOS	Daily Volume	Daily Volume	V/C	LOS	Change in V/C	Project Impact?
Valencia Street											
From Central Ave to Bancroft Dr	Not Classified (2U)	1,500	1,089	0.726	C	96	1,185	0.790	C	0.064	No

Notes: Classification (as built): Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity ratio.

As shown in Table 6, no project impacts were calculated because the project adds less than 100 ADT, which is below the allowable significance criteria.

CORNER SIGHT DISTANCE ANALYSIS

The corner sight distance analysis was based on the 85th percentile vehicular travel speeds collected on Valencia Street in the eastbound and westbound directions on April 21, 2005 (data included in **Attachment C**). The 85th percentile speed on Valencia Street in the eastbound direction was 36 Miles Per Hour (MPH) and 35 MPH in the westbound direction. Looking east from the project driveway along Valencia Street, the required County's corner sight distance of 350 feet was observed looking across the intersection of Valencia Street and Bancroft Drive while Caltrans' stopping sight distance of 255 feet based on 35 MPH (calculations in **Attachment D**) was observed without looking across the intersection of Valencia Street and Bancroft Drive. Looking west from the project driveway along Valencia Street, the required County's corner sight distance of 360 feet was observed. The County and Caltrans sight distance summary is included in **Table 7**.

Table 7: Corner Sight Distance Summary

Proposed Driveway Location	Observed Direction When Leaving	Posted Speed (MPH)	85th Percentile Speed (MPH)	County Minimum Corner Sight Distance[3] and Observation	Caltrans Stopping Sight Distance based on 85th Percentile	Distance from Driveway to Bancroft Dr (CL to CL)
Valencia Street	Looking East	25	35[1]	350 ft Observed Looking Across Bancroft[4]	255 ft Observed without looking across Bancroft	270 ft
	Looking West	25	36[2]	360 ft Observed	Not Applicable	Not Applicable

Source: [1]Speed survey of westbound vehicles approaching driveway. [2]Speed survey of eastbound vehicles approaching driveway. [3]County of San Diego Department of Public Works *Public Road Standards* July 14, 1999. [4]Distance observed only when looking across the intersection of Valencia Street/Bancroft Drive.

INTERSECTION SPACING

The County of San Diego Department of Public Works *Public Road Standards* July 14, 1999 states that non-circulating element roads entering into other non-circulation element roads shall have their centerlines separated by a least 200 feet. The project driveway is located approximately 270 feet (centerline to centerline) west from Bancroft Drive (non-circulation element roadway).

TIF PROGRAM

The County of San Diego has developed an overall programmatic solution that addresses existing and projected future road deficiencies in the unincorporated portion of San Diego County. This program includes the adoption of a Transportation Impact Fee (TIF) program to fund improvements to roadways necessary to mitigate potential cumulative impacts caused by traffic from future development. Based on SANDAG regional growth and land use forecasts, the SANDAG Regional Transportation Model was utilized to analyze projected build-out (year 2030) development conditions on the existing circulation element roadway network throughout the unincorporated area of the County. Based on the results of the traffic modeling, funding necessary to construct transportation facilities that will mitigate cumulative impacts from new development was identified. Existing roadway deficiencies will be corrected through improvement project funded by other public funding sources, such as TransNet, gas tax, and grants. Potential cumulative impacts to the region's freeways have been addressed in SANDAG's Regional Transportation Plan (RTP). This plan, which considers freeway buildout over the next 30 years, will use funds from TransNET, state, and federal funding to improve freeways to projected level of service objectives in the RTP.

The proposed project generates 160 ADT. These trips will be distributed on circulation element roadways in the County that were analyzed by the TIF program, some of which currently or are projected to operate at inadequate levels of service. These project trips therefore contribute to a potential significant cumulative impact and mitigation is required. The potential growth represented by this project was included in the growth projections upon which the TIF project is based. Therefore, payment of the TIF, which will be required at issuance of building permits, in combination with other components of the program describe above, will

mitigate potential cumulative impacts to less than significant. The applicant agrees to pay into the TIF program at the time of pulling building permits and understands that the TIF fees may increase based on an Engineers cost index.

CONCLUSION AND RECOMMENDATIONS

The purpose of this traffic letter report was to determine if any direct traffic impacts would result from the proposed project of 20 condominiums, to document the corner sight distance/intersection spacing at the project driveway, and to document that the applicant agrees to pay into the TIF program to mitigate any potential cumulative impacts. In summary:

1) No direct traffic impacts were calculated at the study intersections during AM and PM peak hours.
2) No direct traffic impacts were calculated on the roadway segment of Valencia Street. The project is calculated to add less than 100 ADT to any surrounding roadway segment; therefore, significant segment impacts cannot be calculated on any other surrounding roadway segments.
3) The corner sight distance at the proposed driveway on Valencia Street meets the County's corner sight distance requirements looking west and meets the corner sight distance requirement looking east across the intersection of Valencia Street and Bancroft Drive. The Caltrans' stopping sight distance was observed looking east without looking across the intersection of Valencia Street and Bancroft Drive. The required corner sight distance was based on the 85% percentile speed.
4) The intersection spacing of the proposed driveway is approximately 270 feet from Bancroft Drive, which is greater than the County's required spacing of 200 feet between the project driveway (non-circulation roadway) and Bancroft Drive (non-circulation roadway).
5) The applicant agrees to pay into the TIF program at the time of pulling building permits and understands that the TIF fees may increase based on an Engineers cost index.
6) Any work along the project frontage within the County's right-of-way will require construction and encroachment permits.

Please call me at (619) 890-1253 if you have any questions.

Sincerely,
LOS Engineering, Inc.

Justin Rasas

Justin Rasas, P.E.(RCE 60690), P.T.O.E.
Principal and Officer of LOS Engineering, Inc.

Attachments.

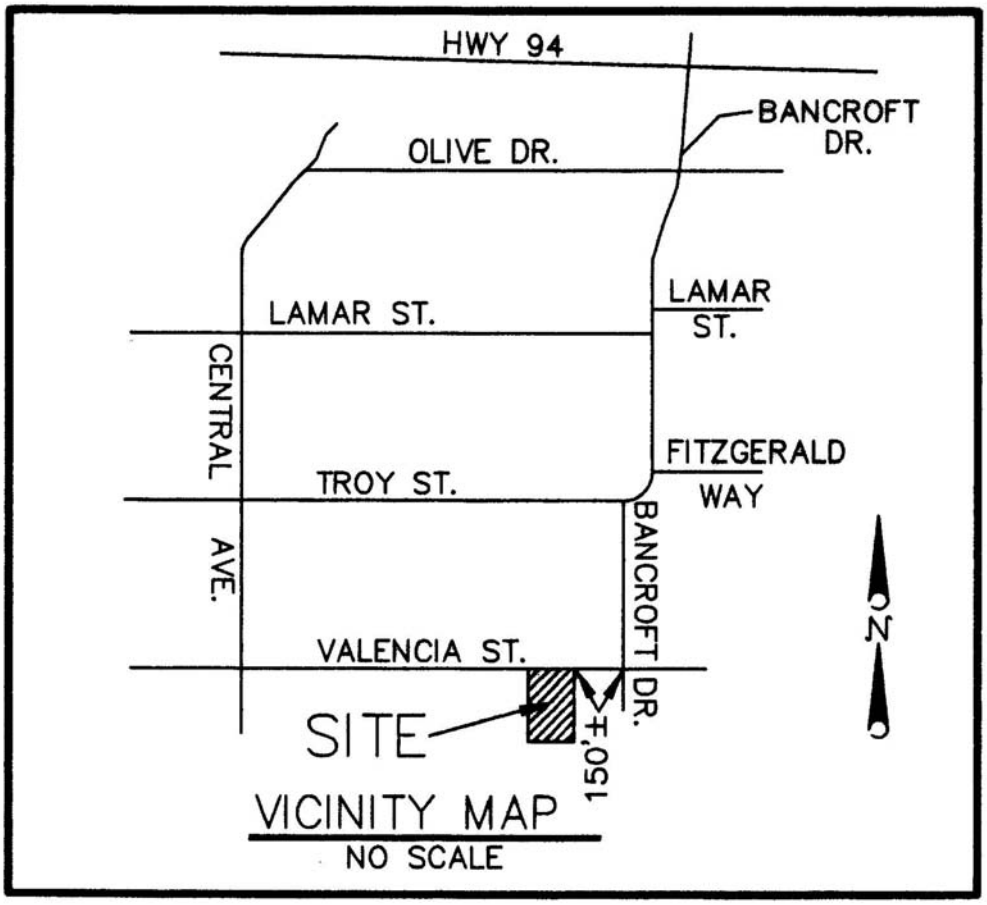


FIGURE 1: Vicinity Map (Source: Landmark Engineering Corporation)

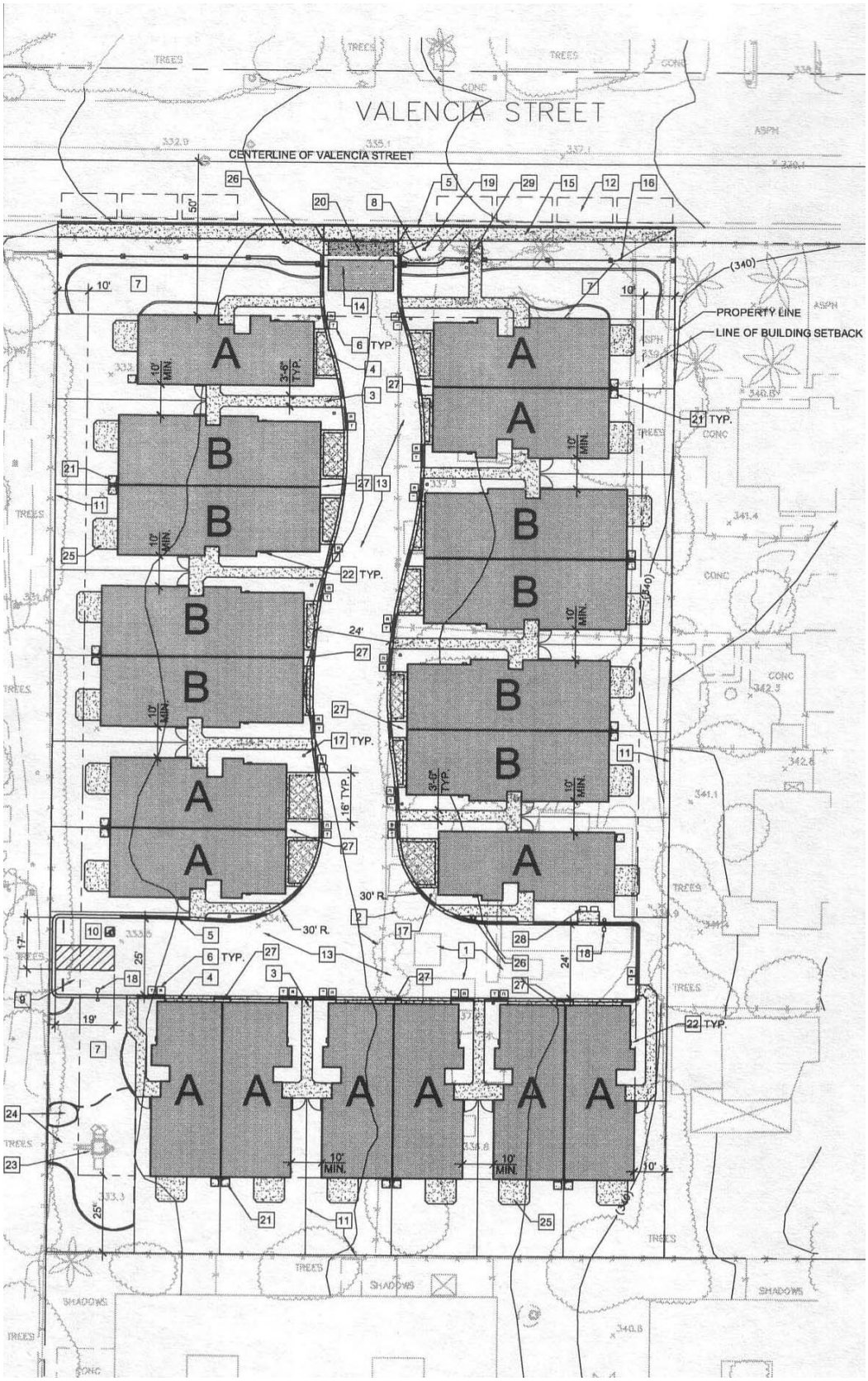


FIGURE 2: Preliminary Site Plan (Source: Witkin Design, Inc.)

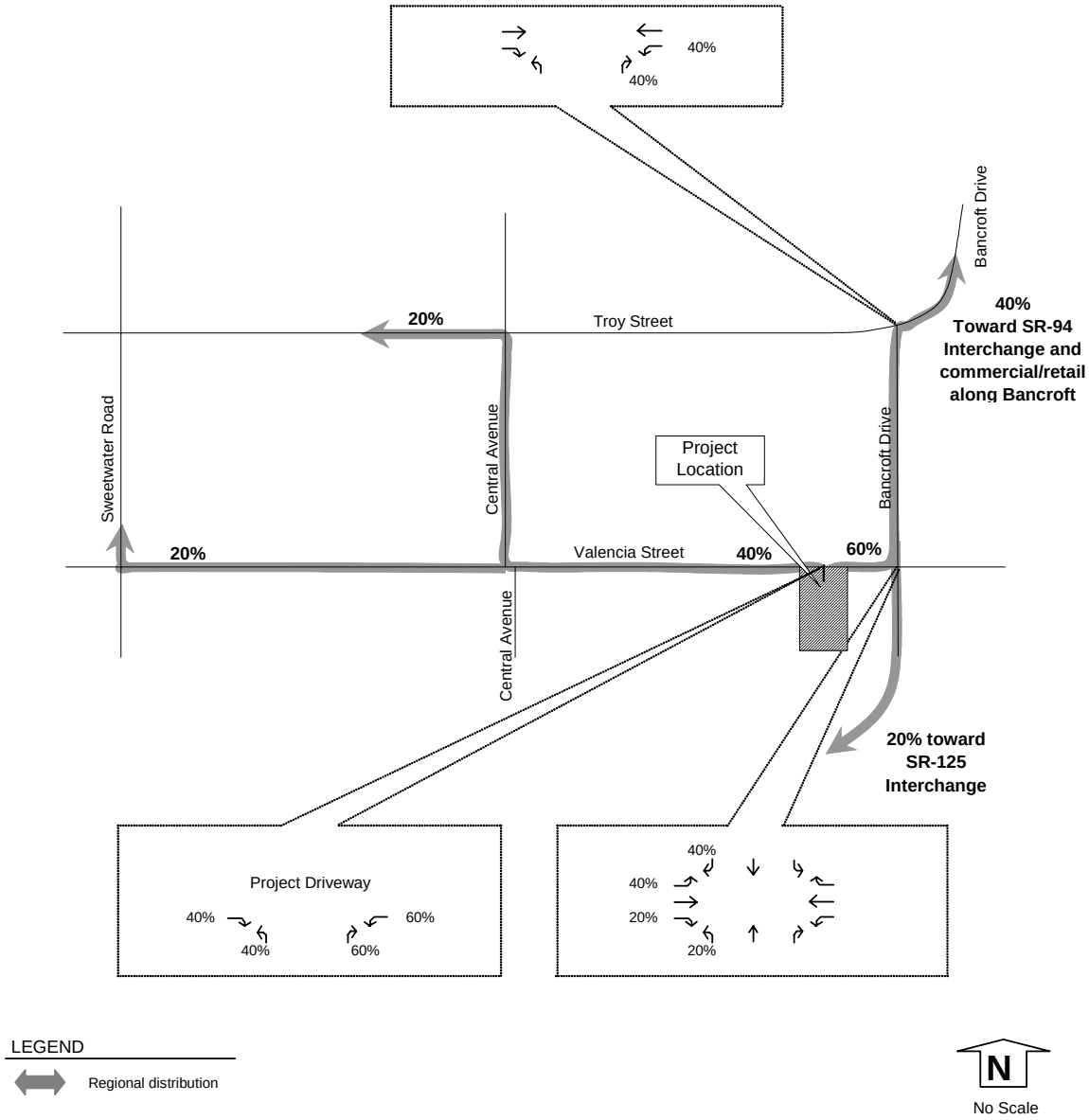


FIGURE 3: Project Distribution

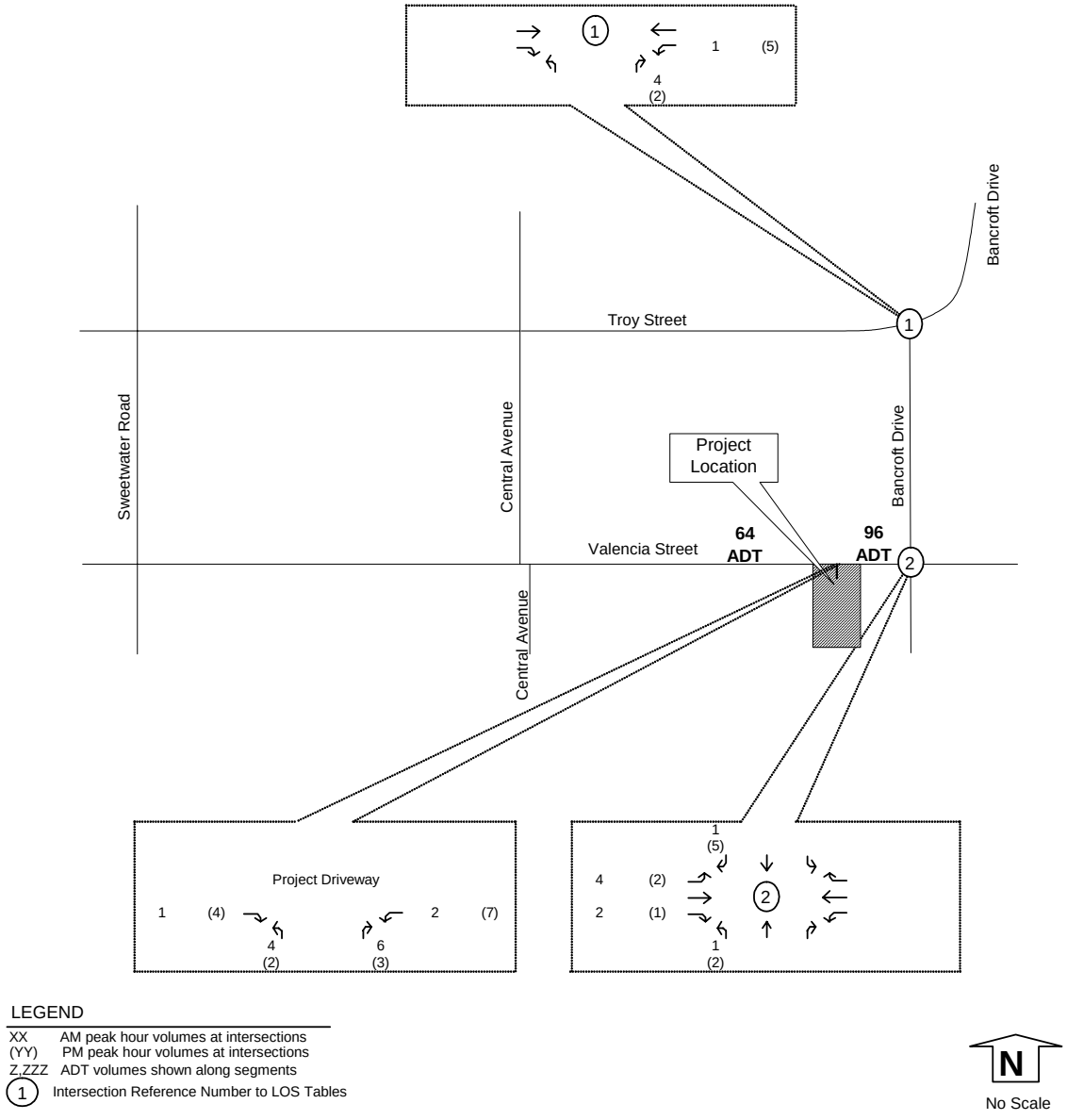


FIGURE 4: Project Assignment

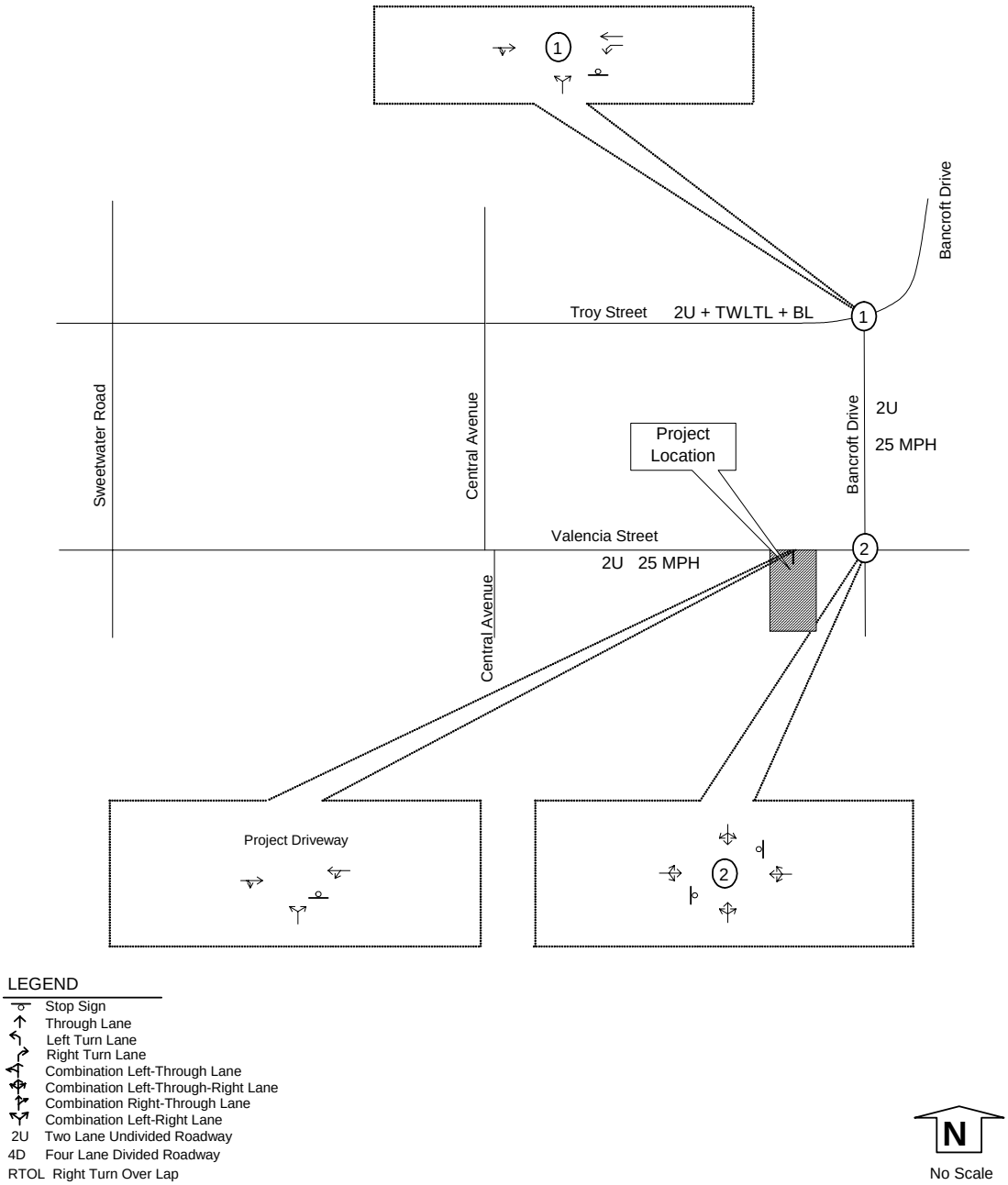


FIGURE 5: Existing Conditions

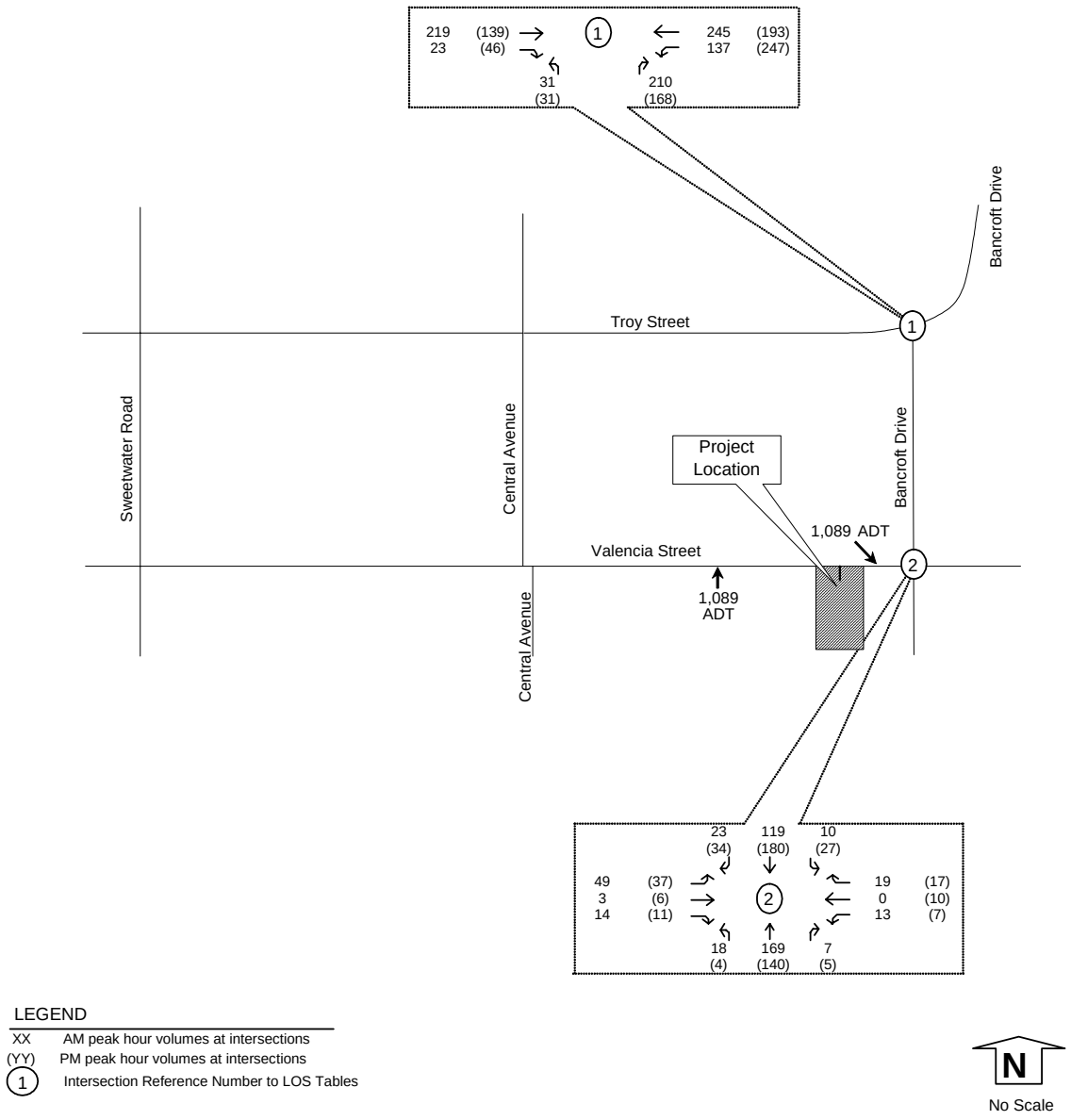


FIGURE 6: Existing Volumes

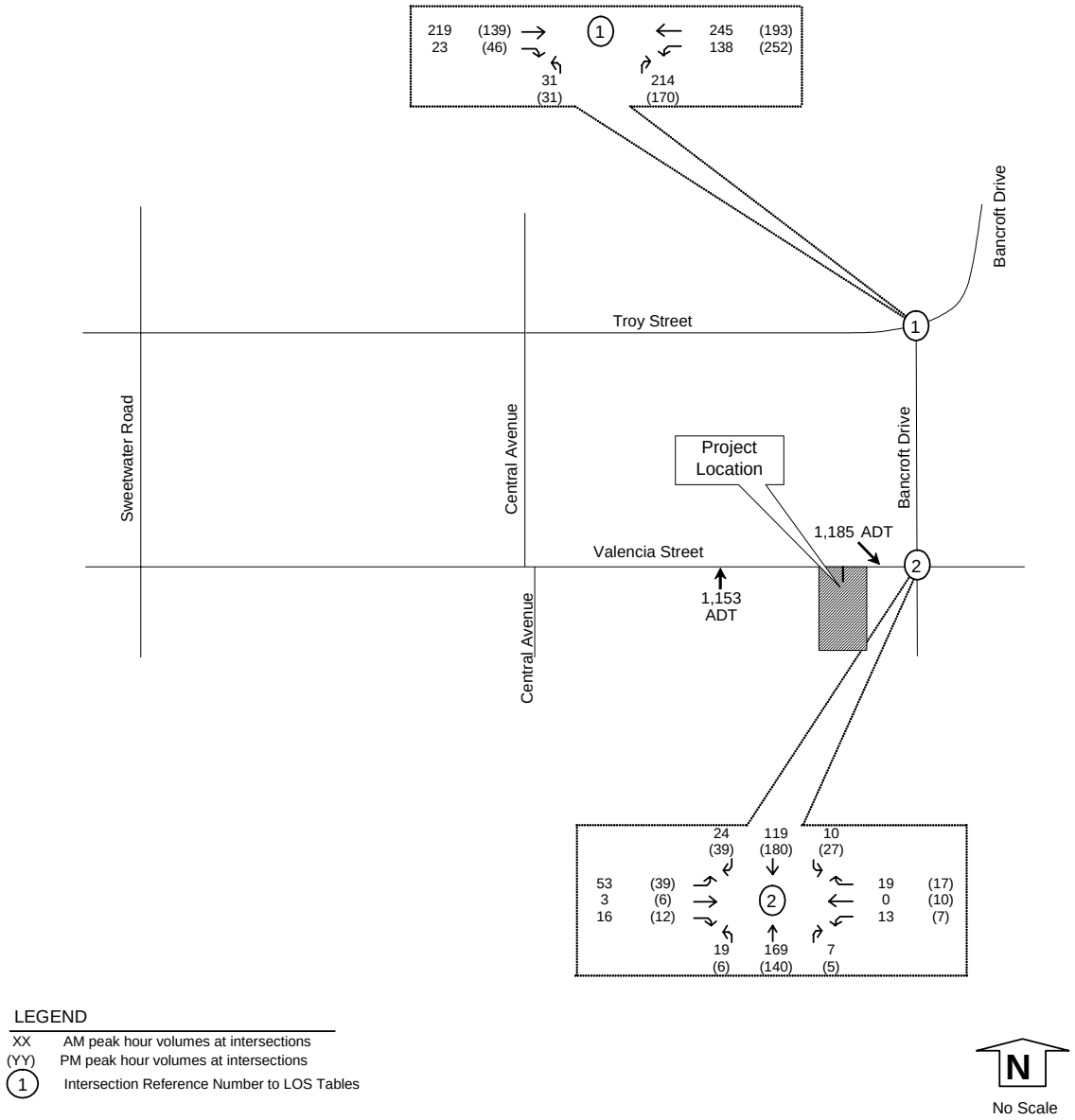


FIGURE 7: Existing + Project Volumes

ATTACHMENT A
COUNT DATA

LOS Engineering, Inc.

6342 Ferris Square, San Diego, CA 92121

Counted By: Emp. #04 Start Date: 06/14/2006

Location: Bancroft Drive & Troy Street File Name: 620-02-1

	Bancroft Drive Northbound				Southbound				Troy Street Eastbound				Bancroft Drive Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	13	0	48	2	0	0	0	0	0	40	3	0	14	44	0	0	162
7:15	15	0	49	2	0	0	0	0	0	40	4	0	27	57	0	0	192
7:30	3	0	53	1	0	0	0	0	0	53	4	0	38	67	0	0	218
7:45	5	0	48	0	0	0	0	0	0	64	3	0	30	77	0	0	227
Total	36	0	198	5	0	0	0	0	0	197	14	0	109	245	0	0	799
8:00	10	0	55	2	0	0	0	0	0	49	7	0	38	54	0	0	213
8:15	13	0	54	2	0	0	0	0	0	53	9	0	31	47	0	0	207
8:30	2	0	28	1	0	0	0	0	0	39	2	0	16	50	0	0	137
8:45	13	0	35	0	0	0	0	0	0	42	5	3	29	46	0	0	170
Total	38	0	172	5	0	0	0	0	0	183	23	3	114	197	0	0	727
Grand Total	74	0	370	10	0	0	0	0	0	380	37	3	223	442	0	0	1526
Approach%	16.3	-	81.5	2.2	-	-	-	-	-	90.5	8.8	0.7	33.5	66.5	-	-	
Total%	4.8	-	24.2	0.7	-	-	-	-	-	24.9	2.4	0.2	14.6	29.0	-	-	

Peak hour analysis for the period 07:30 to 08:15

Volume	31	-	210	5	-	-	-	-	-	219	23	-	137	245	-	-	865
Approach%	12.6	-	85.4	2.0	-	-	-	-	-	90.5	9.5	-	35.9	64.1	-	-	
Total%	3.6	-	24.3	0.6	-	-	-	-	-	25.3	2.7	-	15.8	28.3	-	-	
PHF				0.89				###				0.90				0.89	

LOS Engineering, Inc.

6342 Ferris Square, San Diego, CA 92121

Counted By: Emp. #15 Start Date: 06/14/2006

Location: Bancroft Drive & Troy Street File Name: 620-02-2

	Bancroft Drive Northbound				Southbound				Troy Street Eastbound				Bancroft Drive Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	12	0	30	0	0	0	0	0	0	48	12	0	54	46	0	0	202
16:15	8	0	43	0	0	0	0	0	0	42	15	0	58	52	0	0	218
16:30	3	0	44	0	0	0	0	0	0	40	7	0	49	38	0	0	181
16:45	4	0	49	0	0	0	0	0	0	28	15	1	75	48	0	0	219
Total	27	0	166	0	0	0	0	0	0	158	49	1	236	184	0	0	820
17:00	16	0	32	0	0	0	0	0	0	29	9	0	65	55	0	0	206
17:15	6	0	45	0	0	0	0	0	0	31	6	0	57	54	0	0	199
17:30	3	0	41	0	0	0	0	0	0	28	7	0	48	41	0	0	168
17:45	6	0	27	0	0	0	0	0	0	40	5	0	54	32	0	0	164
Total	31	0	145	0	0	0	0	0	0	128	27	0	224	182	0	0	737
Grand Total	58	0	311	0	0	0	0	0	0	286	76	1	460	366	0	0	1557
Approach%	15.7	-	84.3	-	-	-	-	-	-	78.8	20.9	0.3	55.7	44.3	-	-	
Total%	3.7	-	20.0	-	-	-	-	-	-	18.4	4.9	0.1	29.5	23.5	-	-	

Peak hour analysis for the period 16:15 to 17:00

Volume	31	-	168	-	-	-	-	-	-	139	46	1	247	193	-	-	824
Approach%	15.6	-	84.4	-	-	-	-	-	-	74.7	24.7	0.5	56.1	43.9	-	-	
Total%	3.8	-	20.4	-	-	-	-	-	-	16.9	5.6	0.1	30.0	23.4	-	-	
PHF				0.94				###				0.82				0.89	

LOS Engineering, Inc.

6342 Ferris Square, San Diego, CA 92121

Counted By: Emp. #01 Start Date: 06/14/2006

Location: Bancroft Drive & Valencia Street File Name: 620-01-1

	Bancroft Drive Northbound				Bancroft Drive Southbound				Valencia Street Eastbound				Valencia Street Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	38	2	0	1	15	6	0	5	0	2	2	0	0	2	0	71
7:15	1	32	1	0	2	23	6	0	17	0	4	4	2	1	7	0	96
7:30	5	42	1	0	5	27	2	0	8	0	2	3	4	0	2	3	98
7:45	0	32	2	1	0	24	5	0	13	0	5	0	2	0	8	0	91
Total	6	144	6	1	8	89	19	0	43	0	13	9	8	1	19	3	356
8:00	10	49	2	9	1	40	8	0	12	1	2	2	7	0	3	3	135
8:15	3	46	2	5	4	28	8	0	16	2	5	1	0	0	6	2	120
8:30	0	26	1	0	0	24	5	0	10	1	3	1	0	1	9	2	80
8:45	0	34	0	0	4	19	4	0	4	1	2	0	0	1	6	0	75
Total	13	155	5	14	9	111	25	0	42	5	12	4	7	2	24	7	410
Grand Total	19	299	11	15	17	200	44	0	85	5	25	13	15	3	43	10	766
Approach%	5.5	86.9	3.2	4.4	6.5	76.6	16.9	-	66.4	3.9	19.5	10.2	21.1	4.2	60.6	14.1	
Total%	2.5	39.0	1.4	2.0	2.2	26.1	5.7	-	11.1	0.7	3.3	1.7	2.0	0.4	5.6	1.3	

Peak hour analysis for the period 07:30 to 08:15

Volume	18	169	7	15	10	119	23	-	49	3	14	6	13	-	19	8	444
Approach%	8.6	80.9	3.3	7.2	6.6	78.3	15.1	-	68.1	4.2	19.4	8.3	32.5	-	47.5	20.0	
Total%	4.1	38.1	1.6	3.4	2.3	26.8	5.2	-	11.0	0.7	3.2	1.4	2.9	-	4.3	1.8	
PHF				0.75				0.78				0.75				0.77	

LOS Engineering, Inc.

6342 Ferris Square, San Diego, CA 92121

Counted By: Emp. #04 Start Date: 06/14/2006

Location: Bancroft Drive & Valencia Street File Name: 620-01-2

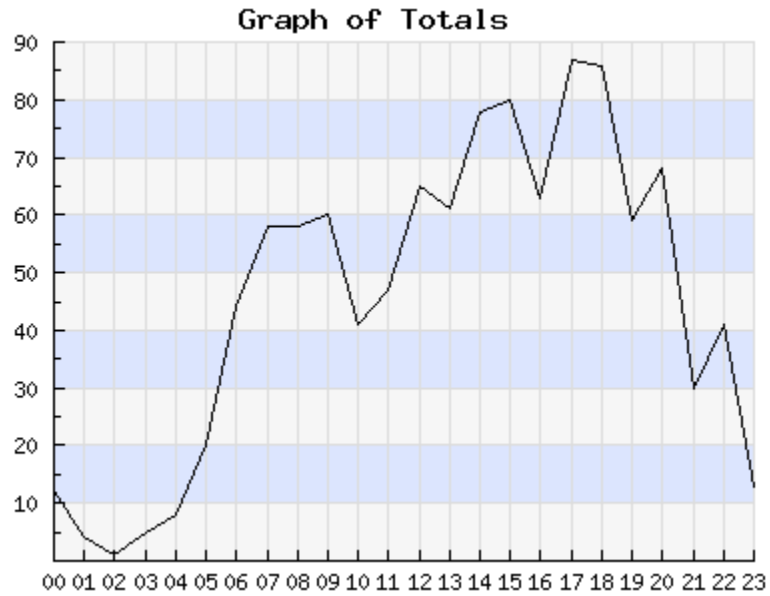
	Bancroft Drive Northbound				Bancroft Drive Southbound				Valencia Street Eastbound				Valencia Street Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	22	0	0	5	45	4	1	9	0	0	0	0	0	6	0	91
16:15	2	30	2	1	4	51	8	0	12	0	5	2	0	0	5	0	119
16:30	2	38	2	0	6	49	8	0	9	2	2	0	1	5	4	0	128
16:45	0	34	0	0	9	35	14	0	9	1	0	0	2	3	2	2	109
Total	4	124	4	1	24	180	34	1	39	3	7	2	3	8	17	2	447
17:00	0	38	1	0	8	45	4	0	7	3	4	1	4	2	6	0	122
17:15	0	28	2	0	5	44	18	0	12	0	1	1	1	0	4	0	115
17:30	1	33	1	8	5	44	17	0	13	2	3	4	2	1	7	2	129
17:45	1	24	0	0	9	40	12	0	8	0	2	1	3	3	7	0	109
Total	2	123	4	8	27	173	51	0	40	5	10	7	10	6	24	2	475
Grand Total	6	247	8	9	51	353	85	1	79	8	17	9	13	14	41	4	922
Approach%	2.2	91.5	3.0	3.3	10.4	72.0	17.3	0.2	69.9	7.1	15.0	8.0	18.1	19.4	56.9	5.6	
Total%	0.7	26.8	0.9	1.0	5.5	38.3	9.2	0.1	8.6	0.9	1.8	1.0	1.4	1.5	4.4	0.4	

Peak hour analysis for the period 16:15 to 17:00

Volume	4	140	5	1	27	180	34	-	37	6	11	3	7	10	17	2	478
Approach%	2.7	93.3	3.3	0.7	11.2	74.7	14.1	-	64.9	10.5	19.3	5.3	19.4	27.8	47.2	5.6	
Total%	0.8	29.3	1.0	0.2	5.6	37.7	7.1	-	7.7	1.3	2.3	0.6	1.5	2.1	3.6	0.4	
PHF				0.89				0.96				0.75				0.75	

Daily Vehicle Volume Report

Location:
Valencia St w/o Bancroft
File Number: 369.1.1
Counter ID: N116JRX9
Report Duration:
02:00 Apr 21, 2005 - 01:59 Apr 22, 2005
Other Notes:
None at this time.



Time	West Bound Volume	East Bound Volume	Total Volume
00:00 - 00:59	6	6	12
01:00 - 01:59	3	1	4
02:00 - 02:59	1	0	1
03:00 - 03:59	2	3	5
04:00 - 04:59	4	4	8
05:00 - 05:59	5	15	20
06:00 - 06:59	21	23	44
07:00 - 07:59	26	32	58
08:00 - 08:59	24	34	58
09:00 - 09:59	32	28	60
10:00 - 10:59	16	25	41
11:00 - 11:59	21	26	47
12:00 - 12:59	31	34	65
13:00 - 13:59	35	26	61
14:00 - 14:59	30	48	78
15:00 - 15:59	40	40	80
16:00 - 16:59	24	39	63
17:00 - 17:59	41	46	87
18:00 - 18:59	40	46	86
19:00 - 19:59	27	32	59
20:00 - 20:59	39	29	68
21:00 - 21:59	18	12	30
22:00 - 22:59	19	22	41
23:00 - 23:59	10	3	13
Total	**515**	**574**	**1089**
AM Peak	9:00	7:30	7:30
Hour	9:59	8:29	8:29
Volume	32	39	70
PM Peak	17:15	14:30	17:15
Hour	18:14	15:29	18:14
Volume	42	50	91

ATTACHMENT B
LOS CALCULATIONS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	219	23	137	245	31	210
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	238	25	149	266	34	228
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			263		815	251
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			263		815	251
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		89	71
cM capacity (veh/h)			1301		307	788

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	263	149	266	262
Volume Left	0	149	0	34
Volume Right	25	0	0	228
cSH	1700	1301	1700	656
Volume to Capacity	0.15	0.11	0.16	0.40
Queue Length 95th (ft)	0	10	0	48
Control Delay (s)	0.0	8.1	0.0	14.1
Lane LOS		A		B
Approach Delay (s)	0.0	2.9		14.1
Approach LOS				B

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	49	3	14	13	0	19	18	169	7	10	119	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	3	15	14	0	21	20	184	8	11	129	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	411	394	142	407	403	188	154			191		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	411	394	142	407	403	188	154			191		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	99	98	97	100	98	99			99		
cM capacity (veh/h)	529	531	906	534	525	855	1426			1382		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	72	35	211	165
Volume Left	53	14	20	11
Volume Right	15	21	8	25
cSH	580	687	1426	1382
Volume to Capacity	0.12	0.05	0.01	0.01
Queue Length 95th (ft)	11	4	1	1
Control Delay (s)	12.1	10.5	0.8	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.1	10.5	0.8	0.6
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	27.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	139	46	247	193	31	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	50	268	210	34	183
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			201		923	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			201		923	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		86	79
cM capacity (veh/h)			1371		241	867

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	201	268	210	216
Volume Left	0	268	0	34
Volume Right	50	0	0	183
cSH	1700	1371	1700	617
Volume to Capacity	0.12	0.20	0.12	0.35
Queue Length 95th (ft)	0	18	0	39
Control Delay (s)	0.0	8.3	0.0	13.9
Lane LOS		A		B
Approach Delay (s)	0.0	4.6		13.9
Approach LOS				B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	37	6	11	7	10	17	4	140	5	27	180	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	7	12	8	11	18	4	152	5	29	196	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	460	439	214	452	455	155	233			158		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	460	439	214	452	455	155	233			158		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	99	99	98	98	98	100			98		
cM capacity (veh/h)	483	499	826	496	489	891	1335			1422		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	59	37	162	262
Volume Left	40	8	4	29
Volume Right	12	18	5	37
cSH	530	634	1335	1422
Volume to Capacity	0.11	0.06	0.00	0.02
Queue Length 95th (ft)	9	5	0	2
Control Delay (s)	12.6	11.0	0.2	1.0
Lane LOS	B	B	A	A
Approach Delay (s)	12.6	11.0	0.2	1.0
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	219	23	138	245	31	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	238	25	150	266	34	233
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			263		817	251
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			263		817	251
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		89	70
cM capacity (veh/h)			1301		306	788

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	263	150	266	266
Volume Left	0	150	0	34
Volume Right	25	0	0	233
cSH	1700	1301	1700	657
Volume to Capacity	0.15	0.12	0.16	0.41
Queue Length 95th (ft)	0	10	0	49
Control Delay (s)	0.0	8.1	0.0	14.2
Lane LOS		A		B
Approach Delay (s)	0.0	2.9		14.2
Approach LOS				B

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	53	3	16	13	0	19	19	169	7	10	119	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	3	17	14	0	21	21	184	8	11	129	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	414	397	142	412	406	188	155			191		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	414	397	142	412	406	188	155			191		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	99	98	97	100	98	99			99		
cM capacity (veh/h)	527	529	905	528	522	855	1425			1382		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	78	35	212	166
Volume Left	58	14	21	11
Volume Right	17	21	8	26
cSH	581	683	1425	1382
Volume to Capacity	0.13	0.05	0.01	0.01
Queue Length 95th (ft)	12	4	1	1
Control Delay (s)	12.2	10.6	0.8	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	12.2	10.6	0.8	0.6
Approach LOS	B	B		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	139	46	252	193	31	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	50	274	210	34	185
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			201		934	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			201		934	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		86	79
cM capacity (veh/h)			1371		236	867

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	201	274	210	218
Volume Left	0	274	0	34
Volume Right	50	0	0	185
cSH	1700	1371	1700	614
Volume to Capacity	0.12	0.20	0.12	0.36
Queue Length 95th (ft)	0	19	0	40
Control Delay (s)	0.0	8.3	0.0	14.1
Lane LOS		A		B
Approach Delay (s)	0.0	4.7		14.1
Approach LOS				B

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	39	6	12	7	10	17	6	140	5	27	180	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	7	13	8	11	18	7	152	5	29	196	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	467	446	217	460	465	155	238			158		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467	446	217	460	465	155	238			158		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	99	98	98	98	98	100			98		
cM capacity (veh/h)	477	494	823	489	482	891	1329			1422		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	62	37	164	267
Volume Left	42	8	7	29
Volume Right	13	18	5	42
cSH	526	628	1329	1422
Volume to Capacity	0.12	0.06	0.00	0.02
Queue Length 95th (ft)	10	5	0	2
Control Delay (s)	12.8	11.1	0.3	1.0
Lane LOS	B	B	A	A
Approach Delay (s)	12.8	11.1	0.3	1.0
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

ATTACHMENT C
SPEED SURVEY DATA

Speed Statistics

SpeedStat-369.1.1-EB
Site: 3690101.0WE
Description: **Valencia Street west of Bancroft Drive**
Filter time: **2:00 Thursday, April 21, 2005 => 2:00 Friday, April 22, 2005**
Scheme: Vehicle classification (Scheme F99)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) Dir(E) Sp(5,100) Sep(>0)

Vehicles = 574
Posted speed limit= 25 mph, Exceeding = 456 (79.44%), Mean Exceeding = 32.28 mph
Maximum = 57.7 mph, **Minimum** = 9.7 mph, **Mean** = 30.1 mph
85% Speed = 36.0 mph, **95% Speed** = 40.3 mph, **Median** = 30.0 mph
10 mph Pace = 24 - 34, **Number in Pace** = 363 (63.24%)
Variance = 37.72, **Standard Deviation** = 6.14 mph

Speed Bins

Speed	Bin		Below		Above		Energy	vMult	n * vMult
0 - 5	0	0.0%	0	0.0%	574	100.0%	0.00	0.00	0.00
5 - 10	1	0.2%	1	0.2%	573	99.8%	0.00	0.00	0.00
10 - 15	2	0.3%	3	0.5%	571	99.5%	0.00	0.00	0.00
15 - 20	21	3.7%	24	4.2%	550	95.8%	0.00	0.00	0.00
20 - 25	94	16.4%	118	20.6%	456	79.4%	0.00	0.00	0.00
25 - 30	164	28.6%	282	49.1%	292	50.9%	0.00	0.00	0.00
30 - 35	184	32.1%	466	81.2%	108	18.8%	0.00	0.00	0.00
35 - 40	75	13.1%	541	94.3%	33	5.7%	0.00	0.00	0.00
40 - 45	26	4.5%	567	98.8%	7	1.2%	0.00	0.00	0.00
45 - 50	5	0.9%	572	99.7%	2	0.3%	0.00	0.00	0.00
50 - 55	1	0.2%	573	99.8%	1	0.2%	0.00	0.00	0.00
55 - 60	1	0.2%	574	100.0%	0	0.0%	0.00	0.00	0.00
60 - 65	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00
65 - 70	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00
70 - 75	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00
75 - 80	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00
80 - 85	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00
85 - 90	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00
90 - 95	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00
95 - 100	0	0.0%	574	100.0%	0	0.0%	0.00	0.00	0.00

Total Speed Rating = 0.00
Total Moving Energy (Estimated) = 0.00

Speed limit fields

	Limit	Below		Above	
0	25 (PSL)	118	20.6%	456	79.4%

Speed Statistics

SpeedStat-369.1.1-WB
Site: 3690101.0WE
Description: **Valencia Street west of Bancroft Drive**
Filter time: **2:00 Thursday, April 21, 2005 => 2:00 Friday, April 22, 2005**
Scheme: Vehicle classification (Scheme F99)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) Dir(W) Sp(5,100) Sep(>0)

Vehicles = 515
Posted speed limit= 25 mph, Exceeding = 381 (73.98%), Mean Exceeding = 31.39 mph
Maximum = 54.2 mph, **Minimum** = 9.4 mph, **Mean** = 28.8 mph
85% Speed = 34.9 mph, **95% Speed** = 39.1 mph, **Median** = 28.6 mph
10 mph Pace = 22 - 32, **Number in Pace** = 318 (61.75%)
Variance = 39.48, **Standard Deviation** = 6.28 mph

Speed Bins

Speed	Bin		Below		Above		Energy	vMult	n * vMult
0 - 5	0	0.0%	0	0.0%	515	100.0%	0.00	0.00	0.00
5 - 10	1	0.2%	1	0.2%	514	99.8%	0.00	0.00	0.00
10 - 15	6	1.2%	7	1.4%	508	98.6%	0.00	0.00	0.00
15 - 20	29	5.6%	36	7.0%	479	93.0%	0.00	0.00	0.00
20 - 25	98	19.0%	134	26.0%	381	74.0%	0.00	0.00	0.00
25 - 30	174	33.8%	308	59.8%	207	40.2%	0.00	0.00	0.00
30 - 35	130	25.2%	438	85.0%	77	15.0%	0.00	0.00	0.00
35 - 40	56	10.9%	494	95.9%	21	4.1%	0.00	0.00	0.00
40 - 45	15	2.9%	509	98.8%	6	1.2%	0.00	0.00	0.00
45 - 50	4	0.8%	513	99.6%	2	0.4%	0.00	0.00	0.00
50 - 55	2	0.4%	515	100.0%	0	0.0%	0.00	0.00	0.00
55 - 60	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
60 - 65	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
65 - 70	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
70 - 75	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
75 - 80	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
80 - 85	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
85 - 90	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
90 - 95	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00
95 - 100	0	0.0%	515	100.0%	0	0.0%	0.00	0.00	0.00

Total Speed Rating = 0.00
Total Moving Energy (Estimated) = 0.00

Speed limit fields

	Limit	Below		Above	
0	25 (PSL)	134	26.0%	381	74.0%

ATTACHMENT D
CALTRANS' STOPPING SIGHT DISTANCE AND CALCUALTIONS

CHAPTER 200
GEOMETRIC DESIGN AND STRUCTURE STANDARDS

Topic 201 - Sight Distance

Index 201.1 - General

Sight distance is the continuous length of highway ahead visible to the driver. Three types of sight distance are considered here: passing, stopping, and decision. Stopping sight distance is the minimum sight distance to be provided on multilane highways and on 2-lane roads when passing sight distance is not economically obtainable. Stopping sight distance also is to be provided for all elements of interchanges and intersections at grade, including private road connections (see Topic 504, Index 405.1, & Figure 405.7). Decision sight distance is used at major decision points (see Indexes 201.7 and 504.2).

The following table shows the standards for passing and stopping sight distance related to design speed, and these shall be the minimum values used in design.

Table 201.1
Sight Distance Standards

Design Speed(1) (km/h)	Stopping(2) (m)	Passing (m)
30	30	217
40	50	285
50	65	345
60	85	407
70	105	482
80	130	541
90	160	605
100	190	670
110	220	728
120	255	792
130	290	855

(1) See Topic 101 for selection of design speed.
(2) Increase by 20% on sustained downgrades >3% & > 2 km.

Chapter III of "A Policy on Geometric Design of Highways and Streets," AASHTO, 1994, contains a thorough discussion of the derivation of stopping sight distance.

201.2 Passing Sight Distance

Passing sight distance is the minimum sight distance required for the driver of one vehicle to pass another vehicle safely and comfortably. Passing must be accomplished assuming an oncoming vehicle comes into view and maintains the design speed, without reduction, after the overtaking maneuver is started.

Chapter III of "A Policy on Geometric Design of Highways and Streets," AASHTO, contains a thorough discussion of the derivation of passing sight distance. In brief, AASHTO states that the sight distance available for passing at any place is the longest distance at which a driver whose eyes are 1070 mm above the pavement surface can see the top of an object 1300 mm high on the road.

In general, 2-lane highways should be designed to provide for passing where possible, especially those routes with high volumes of trucks or recreational vehicles. Passing should be done on tangent horizontal alignments with constant grades or a slight sag vertical curve. Not only are drivers reluctant to pass on a long crest vertical curve, but it is impracticable to design crest vertical curves to provide for passing sight distance because of high cost where crest cuts are involved. Passing sight distance for crest vertical curves is 7 to 17 times longer than the stopping sight distance.

Ordinarily, passing sight distance is provided at locations where combinations of alignment and profile do not require the use of crest vertical curves.

Passing sight distance is considered only on 2-lane roads. At critical locations, a stretch of 3- or 4-lane passing section with stopping sight distance is sometimes more economical than two lanes with passing sight distance.

Passing on sag vertical curves can be accomplished both day and night because headlights can be seen through the entire curve.

Stopping Sight Distance
Caltrans TBL 201.1

Km/Hr	MPH	Meters	Feet
30	18.63	30	98
32.2	20	34	113
40	24.84	50	164
48.3	30	62	205
50	31.05	65	213
56.4	**35**	**78**	**255**
60	37.26	85	279
64.4	40	94	308
70	43.47	105	344
72.5	45	111	365
80	49.68	130	426
90	55.89	160	525
100	62.1	190	623